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New records of crustose lichens from China — 1

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Abstract — During recent studies on the crustose lichens from northeast China, *Cyphelium lucidum*, *Varicellaria lactea*, and *Diploschistes euganeus* were revealed as new records for China or mainland China. Illustrations and brief taxonomic descriptions are provided for these three newly reported species.

Key words — lichenized fungi, taxonomy, Greater Khingan Mountains

Introduction

In the course of our investigations on the lichen flora of northeast China, three new lichen records for China or mainland China were discovered. There are two mountain ranges in northeast China: the Greater Khingan Mountains and the Lesser Khingan Mountains. The average precipitation exceeds 500 millimeters annually in the mountains, and the northern half of the mountains is the coldest part of eastern China, with an extremely severe winter (mean temperature –28°C). The mountains are covered by forests of larch, birch, aspen, and pine. Specimens collected from other parts of China were also studied. Illustrations and brief taxonomic descriptions are provided for the newly reported taxa.

Materials & methods

All specimens examined are deposited in the Lichen Section of Botanical Herbarium, Shandong Normal University, Jinan, China (SDNU).

The lichen specimens were examined using an Olympus SZ 51 stereomicroscope and hand-cut sections under an Olympus CX 21 compound microscope. Photographs of the thallus were taken with an Olympus SZX16 camera with DP72. Color reactions (spot tests) were made using standard methods (Orange et al. 2001). Secondary metabolites of all specimens were identified using thin layer chromatography (TLC) as described by Elix et al. (1987) and Orange et al. (2001).

The new records

Cyphelium lucidum (Th. Fr.) Th. Fr., Gen. Heterolich. Eur.: 101 (1861) Plate 1a

This species is characterized by a brilliant greenish yellow, areolate thallus; prominent, well dispersed, cup-like, black apothecia with sometimes lightly yellow pruinose discs; always yellow pruinose rim of the apothecia; ascospores 2-celled, about 10–20 × 7.5–10 µm, with a very rough surface; and the production of vulpinic acid. *Cyphelium notarisii* (Tul.) Blomb. & Forssell is another species with yellow-green thallus reported in China (Wu et al. 1997), but *C. notarisii* has immersed, epruinose apothecia and submuriform ascospores.

Specimen examined — **China. Heilongjiang Prov.**: Tahe County, Mengkeshan Forestry Centre, alt. 555 m, on bark of *Larix* sp., 14 Aug. 2009, Qiang Ren 2009197 (SDNU).

Varicellaria lactea (L.) Schmitt & Lumbsch, Mycokeys 4: 31 (2012) Plate 1b

Diagnostic characters are the white-grey thallus with a regularly rimose-areolate surface; the round white soralia; the production of lecanoric acid; and the substrate of dry, siliceous or slightly calcareous rock. Apothecia were not seen in Chinese materials. The species might be confused with *Pertusaria hemisphaerica* (Flörke) Erichsen and *P. excludens* Nyl., but *P. hemisphaerica* has a pale blue-grey thallus with paler markedly convex soralia, which is C+ red,

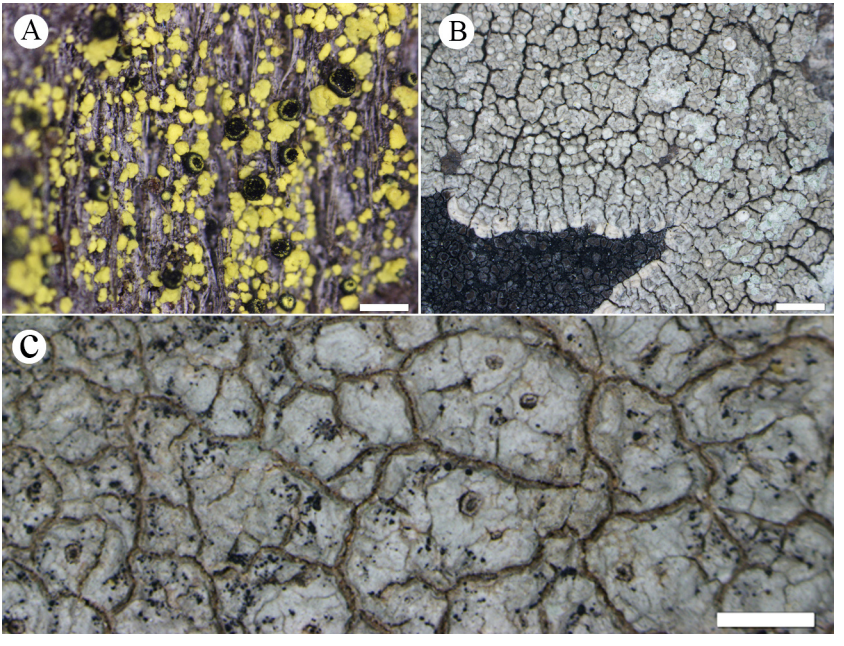

Plate 1. A, *Cyphelium lucidum* (Qiang Ren 2009197); B, *Varicellaria lactea* (Qiang Ren 2012201); C, *Diploschistes euganeus* (Daifeng Jiang 20120613). Scale bars: A = 0.5 mm; B = 2 mm; C = 1 mm.

and occurs on trees. *Pertusaria excludens* also occurs on rocks but produces a C– medulla and soralia.

Specimens examined — **CHINA**. **Inner Mongolia**: Eerguna City, Eerguna Nature Reserve, 51°50.763′N 120°38.860′E, alt. 532 m, on siliceous rocks, 14 Aug. 2012, Qiang Ren 2012165 (SDNU); Moerdaoga Forest Park, 51°27.415′N 120°45.699′E, alt. 750 m, on siliceous rock, 10 Aug. 2012, Qiang Ren 2012060 (SDNU); Moerdaoga Forestry Bureau, Mt. Jiageda, 51°22.698′N 120°49.745′E, alt. 1255 m, on calcareous rock, 15 Aug. 2012, Qiang Ren 2012201 (SDNU). **Jinlin Prov.**: Yanji City, Wangqing County, Tianqiaoling Town, Mt. Tulaopo, alt. 1011 m, on siliceous rock, 1 Dec. 2007, Chao Yuan & Liyan Sun 20073409, 20073419 (SDNU). **Xizang**: Baxiu County, Ranwu Town, Laigu Glacier, alt. 4200 m, on siliceous rock,,32 Oct. 2007, Guoying Han 20072967 (SDNU).

Diploschistes euganeus (A. Massal.) J. Steiner, Verh. Zool.-Bot. Ges. Wien 69: 96 (1919) Plate 1c

This species is characterized by the thin whitish gray thallus that is rimose-areolate; perithecioid, immersed to semi-immersed ascomata; 8-spored asci with brown, broadly ellipsoid ascospores; absence of lichen metabolites; and a siliceous rock substrate. *Diploschistes euganeus,* which was reported from Taiwan (Aptroot 2011), is new to mainland China. *Diploschistes arabiensis* Lumbsch also occurs on siliceous rocks and lacks secondary metabolites but differs in its whitish thicker thallus, ridged apothecia, predominantly 6-spored asci, and distribution in Arabia and western North America.

Specimen examined — **CHINA**. **Liaoning**: Chaoyang City, Beipiao County, Mt. Dahei, alt. 1300 m, on siliceous rock, 14 Aug. 2011, Daifeng Jiang 20120613 (SDNU).

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